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Characterizing Apoptosis in the Spinal Cord of PIG11ABBH1 Zebrafish (Danio rerio) Knockouts

Christina Rouhotas
Northeastern Illinois University

Amy Sticha
Northeastern Illinois University, aesticha@neiu.edu

Jorge Cantu
Northeastern Illinois University

CHARACTERIZING APOPTOSIS IN THE SPINAL CORD OF PIG11A^{BBH1} ZEBRAFISH *(DANIO RERIO) KNOCKOUTS*

Christina Rouhotas[1], Amy Sticha[2], and Jorge A. Cantu Ph.D.[1]
[1]Department of Biology, Northeastern Illinois University, Chicago, IL, 60625

Programmed cell death, including apoptosis, occurs throughout development for the orderly removal of unnecessary cells. The nervous system relies on apoptosis to shape the developing brain and spinal cord and to ensure proper connectivity. For this study, we investigated a novel gene, *p53-induced gene 11 a* (*pig11a* or *tp53i11a*), that is expressed in apoptotic neurons in the zebrafish called the Rohon-Beard (RB) sensory neurons. The *pig11a* gene is a homolog of the pro-apoptotic PIG11 gene in humans. The RB neurons are essential for touch and escape response in larvae, during the first 3-5 days of development, but are replaced by Dorsal Root Ganglia in the mature animal. To identify whether Pig11a is necessary for apoptosis in RB neurons, we generated a stable knockout using CRISPR/Cas9. To characterize our new mutant, we will perform a histological analysis, using whole-mount immunofluorescence and confocal microscopy, to count the number of TUNEL (a marker of apoptosis) positive RB neurons during peak apoptosis in the spinal cord in *pig11a* knockouts. We hypothesize that there will be a decrease in the number of TUNEL positive cells and no change in zn-12 positive RB neurons in the spinal cord. These data will help us determine whether Pig11a is necessary for apoptosis in the RB neurons. Future studies will be to understand the developmental function of Pig11a in zebrafish and how it facilitates apoptosis at the molecular level.